EXECUTIVE SUMMARY OF THE 1987 TEXAS CLOSURE

Introduction

The Southeast Fisheries Center (SEFC) provides detailed reports that evaluate the Texas Closure management option in either December or January to the Gulf of Mexico Fishery Management Council. This year's reports, presented in January 1988 on the 1987 Closure, are the seventh time that the Southeast Fisheries Center has evaluated the Texas Closure management measure. This summary report provides findings from three more detailed reports.

Background

The Gulf of Mexico Shrimp Fishery Management Plan (FMP), prepared by the Gulf of Mexico Fishery Management Council and implemented in 1981, regulates fishing for brown shrimp in the Exclusive Economic Zone (EEZ) off the coast of Texas. This regulation prohibited brown shrimp fishing in the EEZ during the periods: May 22-July 15, 1981; May 26-July 14, 1982; May 27-July 15, 1983; May 16-July 6, 1984; and May 20-July 8, 1985. In both 1986 and 1987 only the portion of the EEZ from 9 to 15 miles was closed to fishing. In 1986 it was closed from 10 May to July 2, 1986, while in 1987 it was closed from June 1 to July 15, 1987. State of Texas regulations, implemented in 1960, prohibited shrimp fishing in the territorial sea off Texas during these same periods, except for the white shrimp fishery inside of 4 fm.

The management objectives of the Texas closure regulation (as specified in the FMP) are to increase the yield of shrimp and eliminate the waste of the resource caused by discarding undersized shrimp caught during a period in their life cycle when they are growing rapidly. The objective of the 1960-1980 Texas territorial sea closure was to insure that a substantial portion ($\geq$50%) of the shrimp in Gulf

waters had reached 65 tails/lb or 112 mm in length by season's opening. Thus, the temporary closure of the offshore fishery from mid-May to mid-July each year provides larger shrimp to the fishery when fishing is again permitted in mid-July. The monetary benefits of this management regulation result from catching more valuable shrimp.

Methods

The research approach in 1987 was similar to that used in most previous years, except like 1986 we treated the 1987 closure as if the entire EEZ were open. Analysis of pre-closure June data supported this approach. Simulation analysis compared this years closure with a complete 200 nautical mile closure. The scientific analyses were based on resource survey and fishery statistical data.

Port agents collected statistics on the catch, effort, and fishing location of shrimp vessels operating in the Gulf of Mexico. These data provided information on the species, size, and location of shrimp, as well as information on the catch rates and fishing tactics of the vessels in the fleet. The data were used as input into cohort-type simulation models to estimate recruitment, fishing mortality, and the effects of the closure on biological yield, ex-vessel prices, and value. Price data, collected by the port agents, were incorporated into the models to evaluate the economic impact of the closure. A special social survey was conducted to evaluate the social impacts of the 1987 Texas closure.

Conclusions

1. Recruitment

Recruitment of brown shrimp to Texas offshore waters in 1987 appeared to be slightly higher than in 1986, but significantly lower than in 1981. We predicted the 1987 annual offshore harvest to be 25.7 million pounds, which is slightly below the average (long-term) production of 26.9 million

pounds. This prediction was based on data collected from the Galveston Bay bait shrimp fishery during May and early June.

Louisiana Department of Wildlife and Fisheries indicated that brown shrimp recruitment west of the Mississippi River would be higher than most other years except 1981 and 1986. The NMFS forecasted an annual harvest of 32.9 million pounds for the combined inshore and offshore fishery in areas 13-17, which is above the historical average of 27.0 million pounds.

2. Commercial Fishing Results

In 1987, the total Louisiana May-August catch was 33.2 million pounds compared to 25.1 million pounds in Texas. Recruitment levels were only slightly different between areas 13-17 and 18-21.

The Texas offshore brown shrimp catch in July and August 1987 was 14.2 million pounds compared to 10.7 in 1986, 14.0 in 1985, 15.3 in 1984, 9.8 million pounds in 1983, 13 million pounds in 1982, and 25 million pounds in 1981. Considerable discarding of small shrimp was encountered in 1985 with an estimated 1.1 million pounds being discarded in the first six weeks of the open season. In 1986 only 23,000 pounds of shrimp were discarded, while in 1987 approximately 103,000 pounds were discarded. Previous studies have shown that on the average 33% of the total number of shrimp caught between May-August are discarded off the Texas coast. This high rate of discarding was not evident in either 1986 or 1987.

Fishing effort was much greater off both Louisiana and Texas in 1987 than in most other years (Table 1). An increasing trend in effort has been documented for the past several years and does not appear to be an effect of the closure.

The average catch per unit of effort (CPUE) off Texas for July-August 1987 period was 789 pounds/day compared to 856 pounds/day in 1986, 918 pounds/day in 1985, 819 pounds/day in 1984, 962 pounds/day in 1983, 922 pounds/day in 1982 and 1,895 pounds/day in 1981. Off Louisiana the average CPUE for the July-August 1987 period was 589 pounds/day, whereas the July-August 1986 period average CPUE was 813 pounds/day. Thus, during the July-August 1986 period, the Texas and Louisiana offshore brown shrimp CPUE values were almost identical. In all other closure years including 1987, the CPUE off Texas was at least 1.5-2.0 times greater than off Louisiana (Table 1).

The July size composition of the 1987 offshore brown shrimp catch in Texas waters was different from other closure years with the average size of about 45 count, compared to an average of 40-43 count since 1981.

The Louisiana inshore brown shrimp fishery produced 12.4 million pounds in 1987 compared with 14.3 million pounds in 1986. The inshore catch had an average tail size of 116 per pound in May and 114 per pound in June. The Texas inshore fisheries accounted for approximately 7.6 million pounds of brown shrimp in 1987, 5.1 million pounds in 1986, 5.4 million pounds in 1985, but 7.1 million pounds in 1984. The inshore catch in 1987 was predominated also by shrimp of 116 or greater, with the average size count of 130 in May and 125 in June.

Overall, small shrimp were prevalent throughout the bays in May and June, resulting in small shrimp available to the Texas offshore fishery in July, and <38 count shrimp available in August.

3. Vessel Activity

The ratio of June/August effort in 1986 and 1987 was above closure (1981-1985) levels, indicating that fishing effort that had not occurred in past years because of the closure, re-entered the June offshore fishery the last two years. The fraction of Gulf-wide effort fishing off Texas in August 1987 was at pre-closure levels, as it had been in 1983, 1984 and 1986 (but not 1985), suggesting that no additional shift in effort to or away from Texas occurred this year. For the second straight year, August fell behind July as the month of maximum offshore effort.

Home port information indicated that during the June 1 through August 31 period Louisiana vessels predominantly landed in Louisiana and very few Texas vessels landed in Louisiana. Likewise, Texas vessels predominantly caught the majority of shrimp landed in Texas. Louisiana vessels rarely landed in Texas. Over 80% of the offshore landings in Louisiana were caught by Louisiana vessels and between 80-90% of the Texas landings were caught by Texas vessels or boats.

4. Impacts of the 1986 FCZ Closure on CPUE and Yield

Potential increases in harvests of large shrimp were exchanged for access to offshore waters in May and June since many small shrimp were caught during this period. The CPUE ratio (Texas/elsewhere) in July 1987 fell to a level comparable with pre-closure years, indicating no appreciable build-up in biomass due to the 9-15 mile EEZ closure. The July CPUE off Texas was similar to pre-closure years and, for the second time since closures began, it was also similar to the CPUE off Louisiana.

In biological year 1987 a complete closure would have increased Gulf-wide yield with a gain of 0.8 million pounds

(1.2%) and an increase in dollars to the fishery of around 10.1 million dollars (3.5%). Projections for the May 1987-April 1988 period show a gain of 2.2 million pounds, if the closure had been in effect to 200 nautical miles.

5. Gross ex-vessel benefits to the Gulf-wide brown shrimp fishery if the total EEZ would have been closed in 1987 were estimated to have been $10.1 million, for the May-August 1987 period. This estimated gain resulted from a loss of $5.6 million for small shrimp and a gain of $6.1 million for medium shrimp and $9.5 million for large shrimp.

6. A social survey conducted with vessel captains about their feelings with regard to the combined closure off Texas, yielded similar results to those produced last year. Louisiana and upper Texas port vessel captains were still against any type of federal closure off Texas, while captains from Florida, Alabama and lower Texas ports were in favor of the closure. These differences appear to be influenced by the relative number of freezer vessels involved in the fishery, since they generally react positively toward the closure of waters to 200 miles..

7. Conclusions about the 1987 seasonal closure are mixed. It appears that a gain in both pounds and dollars would have occurred in the Gulf-wide brown shrimp fishery if the EEZ had been closed to 200 nautical miles. Vessel mobility was, however, less than in previous closure years. Vessels tended to fish off their own state more in 1987. Enforcement of the 15 nautical mile closure was a major problem, with about 40 vessels being caught fishing illegally in the EEZ. Thus, the goals of the FMP were again only partially achieved in 1987.

Texas Closure Reports

Titles of reports on the Texas closure submitted to the Gulf Council in January 1988.

Economic impacts of the 1987 Texas closure regulation. John Ward.

Review of the 1987 Texas closure for the shrimp fishery off Texas and Louisiana. James M. Nance, Edward F. Klima, Peter F. Sheridan, Neal Baxter, Frank J. Patella and Dennis B. Koi.

Stock assessment for brown, white and pink shrimp in the U.S. Gulf of Mexico, 1960-1985. James M. Nance and Scott Nichols.

Table 1. Commercial catch statistics for the Gulf of Mexico brown shrimp fishery.

July-August brown shrimp landings (millions of pounds), fishing effort (1,000 days) and CPUE (pounds per day).

	1981	1982	1983	1984	1985	1986	1987
Texas Offshore							
Catch	25.0	13.0	9.8	15.3	14.0	10.7	14.2
Effort	14.8	15.7	10.3	18.6	15.2	12.5	18.1
CPUE	1,895	922	962	819	918	856	789
Louisiana Offshore							
Catch	10.5	5.1	4.9	6.6	6.1	9.6	9.3
Effort	11.9	9.8	11.2	11.2	9.7	11.8	15.8
CPUE	863	524	439	587	625	813	589

Table 2. Summary of analytical results of the Texas closure shrimp fishery management measure, 1981-1985. Values shown are the statistics used to measure the effects of the closure for the FCZ alone and for the Territorial sea and FCZ combined.

Statistic	Year						
	1981	1982	1983	1984	1985	1986	1987
FCZ Closure Alone							
1. CPUE ratio Texas:elsewhere[1/]							
July	2.26	2.06	2.34	1.86	1.74	1.24	1.47
August	1.56	1.35	1.40	1.34	0.96	1.10	1.12
2. Change in Gulf-wide Yield[2/]							
(May-Aug)	+4.0 (5%)	+0.7 (1%)	-0.5 (1%)	-0.6 (1%)	-2.5 (4%)	-1.3 (2%)	+0.8 (1.2%)
(May-Apr)	+4.2 (4%)	+1.4 (2%)	+0.4 (1%)	+1.4 (2%)	-0.3 (4%)	+1.1 (1.2%)	+2.2 (2.7%)
3. Change in Gulf-wide Value[2/]							
(May-Aug)	+10.4 (7%)	+5.3 (3%)	+2.1 (2%)	+8.5 (6%)	-5.1 (-1.2 %)	-0.14 (<1%)	+10.1 (3.5%)
(May-Apr)	+9.7 (4%)	+6.0 (3%)	+6.7 (3%)	+18.7 (9%)	+6.1 (1.4%)	+9.8 (3.5%)	[3/]

[1/]Long-term average CPUE ratios (Texas:elsewhere) for 1960-80 are: July, 1.27; August, 1.06.

[2/]All values (yield in millions of pounds and value in millions of dollars) are if a 200 nautical mile closure was in effect.

[3/]Data required for estimate not yet available.